International Journal of Advanced Research in Physical Science (IJARPS)
Volume 9, Issue 12, 2022, PP 4-8
ISSN No. (Online) 2349-7882
www.arcjournals.org

Alignment of Diverse Untouchable Mass Pertaining to Macro Mass

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Abstract: *The alignment of a diverse untouchable mass pertaining to macro mass in Heraclitean dynamics has been discussed.*

Keywords: *Alignment energy equivalents, diverse untouchable mass pertaining to macro mass, Heraclitean dynamics*

1. Introduction

In previous papers [1], [2], [3] the alignment energy of a diverse untouchable mass pertaining to micro mass $m_1 < \sqrt{\frac{h}{c}}$ in Heraclitean dynamics has been discussed. In this paper we will turn the attention to the untouchable mass pertaining to macro mass $m_1 > \sqrt{\frac{h}{c}}$.

2. The Diverse Untouchable Mass

In Heraclitean dynamics the diverse untouchable mass m of a physical body is defined as a geometric mean of its mass m_1 and co-mass m_2 determined by Planck constant h and the luminal speed c as follows:

$$m = \sqrt{m_1 . m_2} = \sqrt{m_1 . \frac{\frac{h}{c}}{m_1}} = \sqrt{\frac{h}{c}}. \tag{1}$$

3. The Ratio of the Diverse Untouchable Mass Components

A ratio R of both components $m_1$and m_2 of the diverse untouchable mass m can be calculated. Of a physical interest is the ratio greater than unit $R > 1$ since subunit value $R < 1$ cannot be aligned (See section 6). Thus, a heavier component should be divided by the lighter component. We have two circumstances at our disposal:

a) A heavier co-mass m_2 is divided by the lighter micro mass m_1

$$R_{micro} = \frac{m_2}{m_1} > 1. \tag{2}$$

And

b) A heavier macro mass m_1 is divided by the lighter co-mass m_2

$$R_{macro} = \frac{m_1}{m_2} > 1. \tag{3}$$

As announced in the introduction the latter is the subject of interest of this paper.

4. The Unaligned Ratio of the Diverse Untouchable Mass

According to (1), (3) the next unaligned ratio $R_{unaligned}$ of the components - macro mass m_1 and co-mass m_2 - of the diverse untouchable mass m on the double surface with the unit $s(1) = 2 - \frac{1}{\sqrt{1+\pi^2}}$ is given:

$$\frac{R_{unaligned}}{2-\frac{1}{\sqrt{1+\pi^2}}}=\frac{m_1}{m_2}=\frac{m_1}{\frac{\frac{h}{c}}{m_1}}=\frac{m_1^2}{m^2}=\frac{m_1^2c}{h}. \tag{4}$$

5. THE ALIGNED RATIO OF THE DIVERSE UNTOUCHABLE MASS

The aligned ratio $R_{aligned}$ of the components - macro mass $m_1$and co-mass m_2 - of the diverse untouchable mass m on the double surface is the next:

$$R_{aligned}=s(n)=\ n\left(2-\frac{1}{\sqrt{1+\frac{\pi^2}{n^2}}}\right),\quad n\in\mathbb{N}=ROUNDDOWN(R_{unaligned}). \tag{5}$$

6. THE DIFFERENCE BETWEEN UNALIGNED AND ALIGNED RATIO OF THE DIVERSE UNTOUCHABLE MASS

The difference Δ of concerned ratios $R_{unaligned}-R_{aligned}$ is in a subunit range:

$$\Delta=R_{unaligned}-R_{aligned}<1. \tag{6}$$

7. THE ALIGNMENT ENERGY OF THE DIVERSE UNTOUCHABLE MASS

Using ratio of ratios $R_{unaligned}/R_{aligned}$ (4), (5) the alignment energy $E_{alignment}$ of the diverse untouchable mass m pertaining to macro mass m_1 and co-mass m_2 is given:

$$E_{alignment}=\left(\frac{R_{unaligned}}{R_{aligned}}-1\right)m_1c^2. \tag{7}$$

The formula can be written applying relations (4) and (6) in the next form (See appendix 1):

$$E_{alignment}=\frac{1}{\frac{m_1}{\Delta\,.\,hc}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{1}{m_1c^2}}<\frac{1}{\frac{m_1}{hc}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{1}{m_1c^2}} \tag{8}$$

Here Δ denote the subunit difference $R_{unaligned}-R_{aligned}$ (6). Factor $\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)$ is the double surface unit (5). And m_1 is the macro mass of a physical body (1), (3).

It can be shown that the subunit ratio $R<1$ of the diverse untouchable mass components is not of physical interest since for its alignment the infinite energy is needed (See appendix 2).

8. THE APPROXIMATE ALIGNMENT ENERGY OF THE DIVERSE UNTOUCHABLE MASS

The negative factor in the equation (8) is negligible in the case of macro mass $(-\frac{1}{m_1c^2}\approx 0)$ so the approximate alignment energy comes into play:

$$E_{alignment}\approx\frac{1}{\frac{m_1}{\Delta\,.\,hc}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)}<\frac{hc}{m_1\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)}. \tag{9}$$

9. ALIGNMENT ENERGY EQUIVALENTS OF THE DIVERSE UNTOUCHABLE MASS

With the help of equations $h\frac{c}{\lambda}=h\nu=E=mc^2$ the alignment energy equivalents of the diverse untouchable mass are given: the alignment mass, the alignment frequency and the alignment wavelength.

a) The alignment mass equivalent $m_{alignment}=E_{alignment}/c^2$ is the next:

$$m_{alignment}=\frac{1}{\frac{m_1c}{\Delta h}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{1}{m_1}}<\frac{1}{\frac{m_1c}{h}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{1}{m_1}}\approx\frac{h}{m_1c\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)}. \tag{10}$$

To be estimated knowing the value of Planck constant and the luminal speed is needed.

b) The alignment frequency equivalent $\nu_{alignment}=\frac{E_{alignment}}{h}$ is the next:

$$\nu_{alignment} = \frac{1}{\frac{m_1}{\Delta . c}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{h}{m_1 c^2}} < \frac{1}{\frac{m_1}{c}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{h}{m_1 c^2}} \approx \frac{c}{m_1\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)}. \quad (11)$$

To be estimated only knowing the value of the luminal speed is needed.

And

c) The alignment wavelength equivalent $\lambda_{alignment} = \frac{hc}{\mathrm{E}_{alignment}}$ is the next:

$$\lambda_{alignment} = \frac{m_1}{\Delta}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{h}{m_1 c} > m_1\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)-\frac{h}{m_1 c} \approx m_1\left(2-\frac{1}{\sqrt{1+\pi^2}}\right). \quad (12)$$

To be estimated counting the mass of a physical body multiplied by the double surface unit $(2-\frac{1}{\sqrt{1+\pi^2}})$ is quite enough.

For instance, the average brain weight of the adult female and male being 1,198 kg and 1,336 kg, respectively [4], offers the average alignment wavelength equivalent $\lambda_{alignment} = 2{,}150\ m$ what is in the range of social distance l_{social} needed for interactions among acquaintances [5]:

$$\lambda_{alignment}^{brain} = l_{social}. \quad (13)$$

10. Conclusion

In Heraclitean dynamics the wavelength of alignment energy of the diverse untouchable mass pertaining to macro mass is in general proportional to that macro mass, although exceptions may occur.

Dedication

To Saint Nicholas

Figure1. *Saint Nicholas [6]*

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APPENDIX 1

$$E_{alignment} = \left(\frac{R_{unaligned}}{R_{aligned}} - 1\right) m_1 c^2. \tag{7}$$

Applying relation (6) $R_{unaligned} = R_{aligned} + \Delta$ gives

$$E_{alignment} = \left(\frac{R_{aligned} + \Delta}{R_{aligned}} - 1\right) m_1 c^2. \tag{7a}$$

Simplified as

$$E_{alignment} = \frac{\Delta\,.\,m_1 c^2}{R_{aligned}} = \frac{\Delta\,.\,m_1 c^2}{R_{unaligned} - \Delta}. \tag{7b}$$

Taking the inverse form we have

$$\frac{1}{E_{alignment}} = \frac{R_{unaligned} - \Delta}{\Delta\,.\,m_1 c^2} = \frac{R_{unaligned}}{\Delta\,.\,m_1 c^2} - \frac{1}{m_1 c^2}. \tag{7c}$$

Applying relation (4) $R_{unaligned} = \frac{m_1^2 c}{h}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right)$ gives

$$\frac{1}{E_{alignment}} = \frac{\frac{m_1^2 c \left(2 - \frac{1}{\sqrt{1+\pi^2}}\right)}{h}}{\Delta\,.\,m_1 c^2} - \frac{1}{m_1 c^2} = \frac{m_1}{\Delta\,.\,ch}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) - \frac{1}{m_1 c^2}. \tag{7d}$$

And by rearranging we have

$$E_{alignment} = \frac{1}{\frac{m_1}{\Delta\,.\,hc}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) - \frac{1}{m_1 c^2}} < \frac{hc}{m_1\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) - \frac{hc}{m_1 c^2}}. \tag{7e}$$

With an approximate value

$$E_{alignment} \approx \frac{1}{\frac{m_1}{\Delta\,.\,hc}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right)} < \frac{hc}{m_1\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right)}. \tag{7f}$$

APPENDIX 2

$$E_{alignment} = \frac{1}{\frac{m_1}{\Delta\,.\,hc}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) - \frac{1}{m_1 c^2}}. \tag{8}$$

Infinite alignment energy $E_{alignment} = \infty$ is achieved when the denominator is zero

$$\frac{m_1}{\Delta\,.\,hc}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) - \frac{1}{m_1 c^2}. = 0. \tag{8a}$$

We have deal with the next equality

$$\frac{m_1}{\Delta\,.\,hc}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) = \frac{1}{m_1 c^2}. \tag{8b}$$

The next unit value

$$\frac{m_1^2 c}{\Delta\,.\,h}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) = 1. \tag{8c}$$

And the next value of the ratios difference Δ

$$\frac{m_1^2 c}{h}\left(2 - \frac{1}{\sqrt{1+\pi^2}}\right) = \Delta. \tag{8d}$$

Applying equation (4) gives

$$\frac{R_{unaligned}}{2-\frac{1}{\sqrt{1+\pi^2}}}\left(2-\frac{1}{\sqrt{1+\pi^2}}\right)=\Delta\,. \tag{8e}$$

And consequently

$$R_{unaligned}=\Delta. \tag{8f}$$

To the above unaligned ratio $R_{unaligned}$ (8f) belongs the aligned ratio $R_{aligned}$ of zero value (6)

$$R_{aligned}=R_{unaligned}-\Delta=R_{unaligned}-R_{unaligned}=0. \tag{8g}$$

What means that a subunit unaligned ratio $R_{unaligned} < 1$ cannot be aligned as the zero aligned ratio $R_{aligned}=0$ because of lack of an infinite alignment energy. So any subunit ratio $R < 1$ is not of a physical interest.

Citation: *Janez Špringer (2022) "Alignment of Diverse Untouchable Mass Pertaining to Macro Mass" International Journal of Advanced Research in Physical Science (IJARPS) 9(12), pp.4-8, 2022.*